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4-13-04
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Vicci et al.

Group Art Unit: 2632

Serial No.: 09/723,356

Examiner: Not Assigned

Filed: November 27, 2000

Docket No. 421/31

Confirmation No.: 5931

For: METHODS AND SYSTEMS FOR REACTIVELY COMPENSATING MAGNETIC CURRENT LOOPS

PETITION TO MAKE SPECIAL BASED ON PRE-EXAMINATION SEARCH
PURSUANT TO 37 C.F.R. § 1.102 AND M.P.E.P. § 708.02

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

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Technology Center 2600

Sir:

Applicants hereby petition the Commissioner to make the subject U.S. patent application special on a pre-examination search performed by the European Patent Office.

Pursuant to M.P.E.P. § 708.02, Applicants hereby provide the following:

1. Applicants authorize the office to charge the Petition fee of \$130.00 under 37 C.F.R. § 1.17(h) to Deposit Account No. 50-0426.
2. Applicants submit that all the claims in the subject application are directed to a single invention.

3. Applicants hereby state that a pre-examination search has been made. In particular, two pre-examination searches have been made. One search was performed by the U.S. Patent Office as the International Searching Authority in PCT Application No. PCT/US00/33451. The U.S. classes and subclasses searched in the International Search were 361/91, 93; 361/137, 156, 162; 307/102, and 105. A second pre-examination search was performed by the European Patent Office in European Patent Application No. EP 00982557. The International classes searched were G06K7/00, G06K7/10, H01Q7/04, H01Q7/00, and H01Q1/22. Copies of the International and European Search Reports are attached hereto.
4. Pursuant to M.P.E.P. § 708.02, copies of the references deemed most closely related to the subject matter encompassed by the claims are not required because the references have already been made of record in the subject patent application.
5. A detailed discussion of the references, which points out, with the particularity required by 37 C.F.R. § 1.11(b) and (c), how the claimed subject matter is patentable over the references is set forth in detail below.

Detailed Discussion of References and Patentability of Claimed Subject Matter

The present invention, for example as claimed in independent claims 1, 14, 21, 24, 33, and 38, includes methods and systems for reactively compensating magnetic current loops for controlling generation of a local magnetic field. For example, in independent claim 1 as amended in the Preliminary Amendment attached hereto, a magnetic current

loop system is adapted to produce strong near fields and weak far fields. The system includes first and second magnetic current loops for generating a local magnetic field. The magnetic current loops are divided into K sections. Reactive compensation elements are added to each of the K sections. The reactive compensation elements have a reactance that substantially cancels the series reactance of each section at an operational frequency. Adding proper reactive compensation to each section of the coils makes the magnitude and phase of the current on adjacent current loops approximately equal. Moreover, as claimed in claim 1, since current flows in one direction in one current loop and in the opposite direction in the current loop, dipole magnetic fields of the two current loops cancel. As a result, the only far field that remains is the quadrupole field. Since the quadrupole field decreases proportionally to $1/R^3$, where R is the distance from the source, it is possible to increase the power, thereby increasing near or local magnetic fields without producing a corresponding far field that exceeds the appropriate regulatory limit for electromagnetic radiation. (See page 11, lines 10-25 of the present specification.) In addition, as now claimed in the independent claims, by canceling the series reactance of sections in magnetic current loops, precise control of local magnetic fields generated by the magnetic current loops can be achieved. (Emphasis added.)

There is no teaching or suggestion in U.S. Patent No. 5,946,178 to Bijlenga (hereinafter, "Bijlenga") cited in the International Search Report of dividing magnetic current loops into sections and reactively compensated the sections to cancel the series reactance of each section and to control generation a local magnetic field. Bijlenga is directed to an over-voltage protection device for series connected semiconductors. According to Bijlenga, an over-voltage protection device is activated when the voltage across a chain of power

semiconductors exceeds a voltage level. When this happens, a protection device is activated, which causes a capacitor to be charged. (See column 3, lines 55-62 of Bijlenga.) There is absolutely no teaching or suggestion in Bijlenga of reactively compensating magnetic current loops to control generation of a local magnetic field. Accordingly, it is respectfully submitted that the claims are patentable over the disclosure of Bijlenga.

U.S. Patent No. 5,198,746 to Gyugyi et al. (hereinafter, "Gyugyi") cited in the International Search Report fails to teach or suggest method or systems for reactively compensating magnetic current loops to control generation of local magnetic fields. Gyugyi is directed to impedance compensation for a power transmission system. According to Gyugyi, it is desirable to balance the impedance of three phase transmission systems. One method for balancing the impedance is to switch in a dirister capacitor arrangement, as illustrated in Figure 1 of Gyugyi. Another method disclosed in Gyugyi for phase balancing and power transmission systems is to inject a phase quadrature AC voltage at the fundamental frequency in series with the transmission line. (See column 3, lines 18-22 of Gyugyi.) There is no absolutely no teaching or suggestion in Gyugyi of reactively compensating sections of magnetic current loops to control generation of a local magnetic field. Accordingly, it is respectfully submitted that the claims of the present application are patentable over Gyugyi.

U.S. Patent No. 4,757,434 to Kawabata et al. (hereinafter, "Kawabata") cited in the International Search Report is directed to a control circuit for a power inverter. The control circuit senses a difference between the AC output voltage of the power inverter and a sinusoidal reference voltage and produces a modification current to minimize the error.

(See column 1, lines 65 through column 2, line, 16 of Gyugyi.) There is absolutely no teaching or suggestion in Kawabata of adding reactive compensation to magnetic current loops to produce or control generation of a local magnetic field. Accordingly, it is respectfully submitted that the claims of the present application are patentable over the disclosure of Kawabata.

U.S. Patent No. 4,087,646 to Brolin et al. (hereinafter, "Brolin") cited in the International Search Report relates to a circuit for detecting loop currents and dialing pulses on telephone lines. According to Brolin, a detector circuit detects voltages on a subscriber loop using an arrangement of comparators, capacitors, and resistors. (See Figure 1 of Brolin.) There is absolutely no teaching or suggestion in Brolin of adding reactive compensation to magnetic current loops to produce or control generation of a local magnetic field. Accordingly, it is respectfully submitted that the claims of the present application are patentable over the disclosure of Brolin.

U.S. Patent No. 5,523,749 to Cole et al. (hereinafter, "Cole") cited in the Supplemental European Search Report is directed to an antenna-based system for interrogating antenna located on baggage items. According to the system disclosed in Cole, a pair of single turn portal interrogation antenna **75** includes series tuning compactor **76** disposed at intervals around the circumference of the loops. A separate set of field cancellation antenna **78** are mounted on top of the interrogator. (See column 17, line 62 through 18, line 7 of Cole.) Thus, Cole discloses a system in which separate cancellation antenna are used to minimize far field radiation. There is no teaching or suggestion in Cole of reactively compensating magnetic current loops themselves to produce a local magnetic field and reduce far field radiation. For example, Cole states:

Such radiation as does occur is substantially canceled by suitable phased additional currents which flow in the field cancellation antenna **78** mounted on interrogator **1** or else where if desired. (See column 18, lines 14-17 of Cole.)

Thus, rather than teaching reactive compensation of the magnetic-field-generating loops, Cole teaches that separate field cancellation antennae are required. Because Cole fails to teach reactively compensating magnetic current loops in a manner that controls generation of a local magnetic field, it is respectfully submitted that the claims of the present application are patentable over the disclosure of Cole.

U.S. Patent No. 4,922,261 to O'Farrell (hereinafter, "O'Farrell") cited in the Supplemental European Search Report discloses an aerial or antenna system that reduces interferences between transmittal and receiving antennas when the antennas are close to each other. According to O'Farrell, loops are added to transmitting and receiving antennas to increase the mutual coupling between turns of the transmitter and of the receiver but not between each other. In addition, the stated purpose of the system described in O'Farrell is maximizing the transmitted field far from aerial **16**. (See column 3, lines 25-33 of O'Farrell.) There is absolutely no teaching or suggestion in O'Farrell of adding active compensation to magnetic current loops to control generation of a local magnetic field or to reduce a far field. Accordingly, it is respectfully submitted that the claims of the present application are patentable over the disclosure of O'Farrell.

European Patent Publication No. EP 0 645 840 A1 to Nedap (hereinafter, "Nedap") cited in the Supplemental European Search Report is directed to a planar antenna array including multiple loops. The purpose of the planar antenna array is to generate fields that are at right angles with regard to each other so that shop-lifted items can be detected

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regardless of the orientations of the antennas on the items. (See Figure 3 and column 7, line 53 through column 8, line 22 of Nedap.) There is absolutely no teaching or suggestion in Nedap of reactively compensating magnetic current loops to control generation of a local magnetic field and to produce a weak far field. In addition, it is noted that Nedap was listed as only a category A reference in the Supplemental European Search Report.

U.S. Patent No. 4,373,163 to Vandebult (hereinafter, "Vandebult") cited in the Supplemental European Search Report is directed to a loop antenna disposed in an electrostatic shield. The loop antenna includes multiple twists or lobes for achieving far field cancellation. (See column 4, lines 55-60 of Vandebult.) However, there is absolutely no teaching or suggestion in Vandebult of reactively compensating sections of a magnetic current loop to control generation of a local magnetic field. Accordingly, it is respectfully submitted that the claims of the present application are patentable over the disclosure of Vandebult.

International Patent Publication No. WO 97/38404 to Sentry Technology Corporation (hereinafter, "Sentry") cited in the Supplemental European Search Report is directed to an electronic article surveillance system capable of high frequency operation using planar loop antennas. (See Figure 1 of Sentry.) However, there is no disclosure in Sentry of reactively compensating a magnetic current loop to control generation of a local magnetic field. Accordingly, it is respectfully submitted that the claims of the present application are patentable over the disclosure of Sentry.

European Publication No. EP 0 693 733 to Sony Chemicals Corporation (hereinafter, "Sony") cited in the Supplemental International Search Report discloses a short distance communication antenna. The short distance communication antenna

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consist of a first coil wound around a magnetic core and that allows communication between magnetic poles **40A** and **40B** located on opposing ends of the magnetic core. There is absolutely no teaching or suggestion of reactively compensating a magnetic current loop to control generation of a local magnetic field. Accordingly, it is respectfully submitted that the claims of the present application are patentable over the disclosure of Sony.

Accordingly, based on the foregoing, it is respectfully submitted that requirements of M.P.E.P. § 708.02 for a grantable Petition to Make Special based on a pre-examination search have been met. Advancement of the examination of the application is respectfully requested.

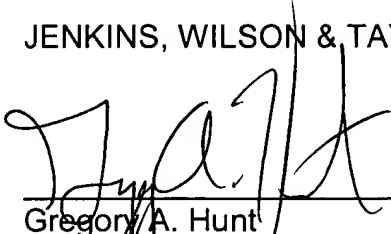
The Commissioner is hereby authorized to charge any fees associated with the filing of this correspondence to Deposit Account No. 50-0426.

Respectfully submitted,

JENKINS, WILSON & TAYLOR, P.A.

Date: March 30, 2004

By: _____


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